

## Patent claims

1. A composite material with a proportion of wood and  
with a proportion of crosslinked plastics,  
5 characterized in that  
  
the proportion of wood has been dispersed in the  
form of particles in the crosslinked plastics, and  
10 the crosslinked plastics are crosslinked melamine  
resin ethers or mixtures composed of from 10 to  
90% by weight of partially crosslinked  
thermoplastics and of from 90 to 10% by weight of  
crosslinked melamine resin ethers.  
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2. The composite material as claimed in claim 1,  
characterized by a proportion of from 55 to 90% by  
weight of wood and a proportion of from 45 to 10%  
by weight of crosslinked plastics.  
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3. The composite material as claimed in claim 1 and  
2, characterized in that the proportion of wood is  
present in the form of wood flour, wood particles,  
wood granules, wood fibers, and/or wood shavings.  
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4. The composite material as claimed in at least one  
of the preceding claims, characterized in that the  
proportion of wood is in particular in the form of  
mixtures composed of wood fibers and of wood  
30 shavings in a ratio of from 1:10 to 10:1 at from  
65 to 80% by weight, and the proportion of  
crosslinked plastics is from 35 to 20% by weight.
5. The composite material as claimed in at least one  
35 of the preceding claims, characterized in that the  
crosslinked plastics are mixtures composed of  
partially crosslinked EVA copolymers whose vinyl  
acetate content is from 25 to 40% by weight and of

WO 2005/009701

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crosslinked melamine resin ethers in a mixing  
ratio of from 2:1 to 1:5.

6. The composite material as claimed in at least one of claims 1 to 5, characterized in that from 3 to 10% by weight of flame retardant, from 0.1 to 2% by weight of pigments, from 0.1 to 5% by weight of stabilizers, and/or from 0.1 to 5% by weight of auxiliaries are present, in each case based on the entirety of wood and plastics.
7. The composite material as claimed in claim 6, characterized in that the stabilizers are UV absorbers and/or free-radical scavengers.
8. The composite material as claimed in claim 6 or 7, characterized in that the auxiliaries are lubricants of the type represented by zinc stearate, calcium stearate, and/or magnesium stearate, and/or release agents of the type represented by talc, aluminum oxide, sodium carbonate, calcium carbonate, silica, and/or polytetrafluoroethylene powder.
9. The composite material as claimed in at least one of the preceding claims, characterized in that the crosslinked melamine resin ethers and the partially crosslinked thermoplastics are present in foamed form.
10. The composite material as claimed in at least one of the preceding claims, characterized in that it is present in the form of a sheet, profile, or injection molding.
11. The composite material as claimed in at least one of the preceding claims, characterized in that the crosslinked melamine resin ethers are crosslinked etherified melamine resin condensates which are free from hydroxymethyleneamino groups bonded to the triazine rings of the melamine resin

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condensate, and from  $\text{-NH-CH}_2\text{-O-CH}_2\text{-NH-}$  groups linking triazine rings, and in which the non-crosslinked etherified melamine resin condensates have been effected via etherification of the

5 hydroxymethylamino groups of the non-etherified

- melamine resin condensates via C<sub>1</sub>-C<sub>18</sub> alcohols and/or via polyols of the type represented by diols, triols, and/or tetrols with molecular weights of from 62 to 20 000, and in which the non-crosslinked etherified melamine resin condensates have been hardened thermally and/or via acidifier.
12. The composite material as claimed in at least one of the preceding claims, characterized in that the partially crosslinked thermoplastics are partially crosslinked ethylene-vinyl acetate copolymers, partially crosslinked partially hydrolyzed ethylene-vinyl acetate copolymers, partially crosslinked thermoplastic polyurethanes, partially crosslinked high-molecular-weight aliphatic and/or aromatic-aliphatic polyethers, and/or partially crosslinked aliphatic and/or aromatic-aliphatic polyesters, preferably partially crosslinked polycaprolactones, and/or unsaturated polyesters.
13. A process for production of a composite material as claimed in claim 1,
- characterized in that
- the composite material is produced by an extruder process, where in a
- a) first stage of the process in a first extruder segment a melt mixture composed of melamine resin ethers, wood, and, if appropriate, thermoplastics is prepared, the melt mixture is devolatilized after homogenization, and, in a second extruder segment, hardener, thermally decomposing free-radical generator, and/or blowing agent are fed into the melt mixture, and are homogenized in the melt mixture, where flame retardants, pigments, stabilizers, and/or auxiliaries can be fed in the

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first and/or second extruder segment, and in a  
b) second stage of the process, the wood-  
containing melt mixture is either heated in a  
third extruder segment, discharged via a die

- with crosslinking and, if appropriate, foaming, and drawn off in the form of a semifinished product, or is discharged from the extruder, and pelletized, and the pellets in a
- 5 c) third stage of the process are processed in presses, extruders, or injection-molding machines with crosslinking and, if appropriate, foaming to give semifinished products or molded materials.
- 10 14. The process as claimed in claim 13, characterized in that the length of the extruders is from 30 to 60 D, the melt mixture in the first extruder segment is prepared at melt temperatures of from 110 to 170°C, the feed in the second extruder
- 15 segment takes place at melt temperatures of from 100 to 150°C, the heating in the third extruder segment takes place to from 150 to 240°C, and the processing in the third stage of the process takes place at temperatures of from 150 to 240°C.
- 20 15. The process as claimed in claim 13 or 14, characterized in that the melt mixture in the first stage of the process is prepared from melamine resin ethers whose weight-average
- 25 molecular weight is from 1500 to 200 000 and whose molar melamine/formaldehyde ratio is from 1:1.5 to 1:4.
- 30 16. The process as claimed in claim 13 or 14, characterized in that, prior to the first stage of the process, wood is impregnated, in mixers, with solutions or dispersions of melamine resin condensates in water or mixtures composed of water and C<sub>1</sub>-C<sub>4</sub> alcohols, and is dried, where the
- 35 melamine resin condensates are etherified melamine resin condensates and/or are melamine resin condensates partially etherified with C<sub>1</sub>-C<sub>4</sub> alcohols, the weight-average molecular weights of

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the condensates being from 150 to 50 000 and their molar melamine/formaldehyde ratio being from 1:1.5 to 1:4, and the melamine resin condensates comprise, if appropriate, up to 3% by weight of hardener, based on the melamine resin condensates, and then the melt mixture

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in the first stage of the process composed of the wood pre-impregnated with melamine resins and also of

- melamine resin ethers or
  - 5       - thermoplastics or
  - mixtures composed of melamine resin ethers and thermoplastics
- is prepared.

10   17. The process as claimed in claim 16, characterized in that the solids content of the solutions or dispersions is from 20 to 80% by weight, the impregnation process takes place at from 80 to 120°C, the length of the extruders is from 30 to 15   60 D, the melt mixtures in the first extruder segment are prepared at melt temperatures of from 110 to 170°C, the feed in the second extruder segment takes place at melt temperatures of from 100 to 150°C, the heating in the third extruder 20   segment takes place to temperatures of from 150 to 240°C, and the processing in the third stage of the process takes place at temperatures of from 150 to 240°C.

25   18. A process for production of a composite material as claimed in claim 1,

characterized in that

30   the composite material is produced by a sintering process where in a

a) first stage of the process, mixtures composed of wood and of plastics which are composed of melamine resin ethers or which are composed of 35   mixtures composed of melamine resin ethers and of thermoplastics, or are composed of thermoplastics, are sintered in high-speed mixers, the sinter mixture is cooled, and, after cooling, hardeners,

- thermally decomposing free-radical generators, and/or blowing agents, flame retardants, pigments, stabilizers, and/or auxiliaries are applied to the sinter mixture in the drum mixer, and in a
- 5 b) second stage of the process, the sinter mixture comprising wood, and comprising melamine resin ethers and, if appropriate, comprising thermoplastics is processed in presses, in extruders,

or in injection-molding machines, with crosslinking and, if appropriate, foaming, to give semifinished products or molded materials.

- 5 19. The process as claimed in claim 18, characterized  
in that the sintering process in the first stage  
of the process takes place in high-speed mixers  
with residence times of from 3 to 30 min and final  
temperatures of from 90 to 180°C, the process of  
10 cooling of the sinter mixture takes place to  
temperatures of from 50 to 120°C, and the  
processing of the sinter mixture in the second  
stage of the process takes place at temperatures  
of from 150 to 240°C.
- 15 20. The process as claimed in at least one of  
claims 13 to 19, characterized in that the wood  
used is in the form of wood flour, wood particles,  
wood granules, wood fibers, or wood shavings, and  
20 comprises from 3 to 10% by weight of sodium borate  
or sodium borate/boric acid mixtures in a ratio by  
weight of from 1:9 to 9:1.
- 25 21. The process as claimed in at least one of  
claims 13 to 20, characterized in that the  
hardener used comprises aliphatic C<sub>4</sub>-C<sub>18</sub> carboxylic  
acids, aromatic C<sub>7</sub>-C<sub>18</sub> carboxylic acids, acidifiers  
of the type represented by blocked sulfonic acids,  
alkali metal salts, or ammonium salts of  
30 phosphoric acid, C<sub>1</sub>-C<sub>12</sub>-alkyl esters or C<sub>2</sub>-C<sub>8</sub>-  
hydroxyalkyl esters of C<sub>7</sub>-C<sub>14</sub>-aromatic carboxylic  
acids or of inorganic acids, salts of melamine or  
of guanamines with C<sub>1</sub>-C<sub>18</sub>-aliphatic carboxylic  
acids, or comprises anhydrides, half-esters or  
35 half-amides of C<sub>4</sub>-C<sub>20</sub> dicarboxylic acids, or  
comprises half-esters or half-amides of copolymers  
composed of ethylenically unsaturated C<sub>4</sub>-C<sub>20</sub>  
dicarboxylic anhydrides and of ethylenically

5       unsaturated monomers of the type represented by  
C<sub>2</sub>-C<sub>20</sub> olefins and/or C<sub>8</sub>-C<sub>20</sub> vinylaromatics, and/or  
salts of C<sub>1</sub>-C<sub>12</sub>-alkylamines and, respectively,  
alkanolamines with C<sub>1</sub>-C<sub>18</sub>-aliphatic, C<sub>7</sub>-C<sub>14</sub>-  
aromatic, or alkylaromatic carboxylic acids, or  
with inorganic acids of the type represented by  
hydrochloric acid, sulfuric acid, or phosphoric  
acid.

22. The use of composite materials as claimed in at least one of claims 1 to 12 in the construction industry, in particular for the production of windows, of doors, of cladding elements, and of roof elements in the outdoor sector, or else in the sports and leisure sector for garden furniture and outdoor seating, and for construction of playgrounds.